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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,031	02/10/2004	William K. Stewart	3336.1019-001	9051

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EXAMINER	
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ART UNIT	PAPER NUMBER
2114	

DATE MAILED: 10/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/776,031	STEWART, WILLIAM K.	
	Examiner	Art Unit	
	Dieu-Minh Le	2114	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 August 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/11/05&10/06/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is response to the communication filed on 10/06/06 in application 10/776,031.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 9-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claims 15-16, claims 15 & 16 should depend to claim 9 instead of claim 1 since these are apparatus claims.

Clarification is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102

of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeffries et al. (US. 5,974,544 hereafter referred to as Jeffries) in view of George (US. 6,993,679).

As per claim 1:

Jeffries substantially teaches the invention. Jeffries teaches:

- A method for operating a Redundant Array of Inexpensive Disks (RAID) to recover from read errors [abstract, col. 2, lines 56 through col. 3, lines 22 and col. 11, lines 17 through col. 12, lines 57]; comprising:
- in a disk controller [col. 11, lines 49-62];
    - detecting that a read error has occurred in a sector associated with a particular Logical Block Address (LBA.sub.i) (i.e., logical address [col.72, lines 30-31 and lines 38-39) in a primary disk portion [col. 12, lines 31-57];
    - reporting an unrecoverable read error at LBA.sub.i; [col. 12, lines 31-57];
    - remapping the sector originally associated with the LBA.sub.i for which the read error occurred to a replacement sector [col. 16, lines 65 through col. 17, line 35, col. 32, lines 14-26].

- in a RAID controller [fig. 3, col. 17, lines 45-56];
    - receiving a report of an unrecoverable read error at LBA.sub.i (i.e., logical address [col.72, lines 30-31 and lines 38-39) in a primary disk portion [col. 13, lines 65 through col. 14, lines 50];
    - retrieving data from a mirror disk portion associated with the primary disk portion that contains LBA.sub.i; [col. 13, lines 65 through col. 14, lines 60, col. 28, lines 60 through col. 29, lines 10].

Jeffries does not explicitly address:
- writing the same data thereby retrieved to the LBA.sub.i on the primary disk portion for which the error was specified.

However, Jeffries does disclose capability of:
- A method and controller for defect tracking in a ***redundant array (i.e., RAID)*** [abstract, col. 72, lines 22-37 comprising capability of:
- ***updating, rebuilding, and writing data to data storage based on the defected listed from its logical address*** [col. 14, lines 61 through col. 15, lines 11; col. 72, lines 40-56].

In addition, George explicitly teaches:
- A method and system for remapping and managing defects in the RAID data storage system [abstract, col. 2, lines 25-39; col. 5, lines 41 through col. 6, lines 26; col. 10, lines 53-64] comprising:

- ***successful writing data to a portion of primary disk based on the logical block address (LBA)*** in supporting the error detection and correction process [col. 8, lines 16-25; col. 11, claims 11; col. 12, claim 18].

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of Applicant's invention to first realizing Jeffries's ***updating, rebuilding, and writing data to data storage based on the defected listed from its logical address*** as being the writing the same data thereby retrieved to the LBA.sub.i on the primary disk portion for which the error was specified as claimed by Applicant. This is because Jeffries's defect tracking in a ***redundant array (i.e., RAID)*** explicitly performed data reading, writing, monitoring, detecting, executing, and control via its ***error or failure detection and correction*** processes. By utilizing these capabilities, the operating processing within the computing memory system, more specifically the RAID, can detect defects properly via its data remapping, executing (i.e., reading/writing), based upon its data receiving and retrieving responses; second, by applying the ***successful writing data to a portion of primary disk based on the logical block address (LBA)*** in supporting the error detection and correction process as taught by George in conjunction with the method and controller for defect tracking in a ***redundant array (i.e., RAID)*** as taught by Jeffries, the RAID memory system can enhance its operation performance, more specifically to ensuring the error detected, corrected, in proper and efficient manner via its remapping and writing processes.

This modification would have been obvious because a person having ordinary skill in the art would have been motivated to do

so to improve the RAID memory operation system availability and network/system performance therein with a mechanism to enhance the data transmission (i.e., receiving and transmitting), data debugging, data mirroring, data reliability, data displaying, and data throughput which eventually will increase its performance, such as data throughput between internal and external devices including the ***logical and physical block addresses*** from a ***disk controller*** as well as a ***RAID controller***.

As per claims 2-4:

Jeffries further teaches:

- reading the data back from LBA.sub.i on the primary portion; and if the data is read back from LBA.sub.i without a further read error, not activating the mirror disk portion [col. 28, lines 60 through col. 29, lines 64];
- the mirror disk portion is located at LBA.sub.i+k in a physical disk drive that is different from the physical disk drive on which LBA.sub.i is stored [col. 28, lines 60 through col. 29, lines 64];
- in the RAID controller [fig. 3, col. 17, lines 45-56], after detecting the unrecoverable read error, executing a background process to regenerate the contents of the primary disk section [col. 13, lines 65 through col. 14, lines 50] that contains LBA.sub.i. [col.72, lines 30-31 and lines 38-39] .

In addition, George explicitly teaches:

- A method and system for remapping and managing defects in the RAID data storage system [abstract, col. 2, lines 25-

39; col. 5, lines 41 through col. 6, lines 26; col. 10, lines 53-64] comprising:

- ***successful writing data to a portion of primary disk based on the logical block address (LBA)*** in supporting the error detection and correction process [col. 8, lines 16-25; col. 11, claims 11; col. 12, claim 18] via ***a disk and array controllers*** [col. 5, lines 41 through col. 6, lines 26].

As per claims 5-6:

Jeffries further teaches:

- replacing and rebuilding disk based on logical address [col. 14, lines 53 through col. 15, lines 11; col.72, lines 30-31 and lines 38-39) in a primary disk portion [col. 12, lines 31-57];
- data restoration in supporting the data remapping in the RAID [col. 16, lines 31-56];

Jeffries does not explicitly address:

- writing the same data retrieved from mirror fails/succeeds.

However, Jeffries does disclose capability of:

- A method and controller for defect tracking in a ***redundant array (i.e., RAID)*** [abstract, col. 72, lines 22-37 comprising capability of:
- ***updating, rebuilding, and writing data to data storage based on the defected listed from its logical address*** [col. 14, lines 61 through col. 15, lines 11; col. 72, lines 40-56].

In addition, George explicitly teaches:

- A method and system for remapping and managing defects in the RAID data storage system [abstract, col. 2, lines 25-39; col. 5, lines 41 through col. 6, lines 26; col. 10, lines 53-64] comprising:
- ***SUCCESSFUL writing data to a portion of primary disk based on the logical block address (LBA)*** in supporting the error detection and correction process [col. 8, lines 16-25; col. 11, claims 11; col. 12, claim 18].

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of Applicant's invention to first realizing Jeffries's ***updating, rebuilding, and writing data to data storage based on the defected listed from its logical address*** as being the writing the same data retrieved from mirror fails/succeeds as claimed by Applicant. This is because Jeffries's defect tracking in a ***redundant array (i.e., RAID)*** explicitly performed data reading, writing, monitoring, detecting, executing, and control via its ***error or failure detection and correction*** processes including the ***logical and physical block addresses*** from a ***disk controller*** as well as a ***RAID controller***. By utilizing these capabilities, the operating processing within the computing memory system, more specifically the RAID, can detect defects properly via its data remapping, executing (i.e., reading/writing), based upon its data receiving and retrieving responses; second, by applying the ***SUCCESSFUL writing data to a portion of primary disk based on the logical block address (LBA)*** in supporting the error detection and correction process as taught by George in conjunction with the method and controller for defect tracking in a ***redundant array***

(i.e., RAID) as taught by Jeffries, the RAID memory system can enhance its operation performance, more specifically to ensuring the error detected, corrected, in proper and efficient manner via its remapping and writing processes for the same reasons set forth as described in claim 1, **supra**.

As per claims 7-8:

Jeffries substantially teaches the invention. Jeffries teaches:

- A method for operating a Redundant Array of Inexpensive Disks (RAID) to recover from read errors [abstract, col. 2, lines 56 through col. 3, lines 22 and col. 11, lines 17 through col. 12, lines 57]; comprising:
- disk controller is located in a common assembly with disk hardware [col. 11, lines 49-62];
- the RAID controller is located in a processor that is a separate assembly from the disk hardware [fig. 3, col. 17, lines 45-56].

In addition, George explicitly teaches:

- A method and system for remapping and managing defects in the RAID data storage system [abstract, col. 2, lines 25-39; col. 5, lines 41 through col. 6, lines 26; col. 10, lines 53-64] comprising:
- ***successful writing data to a portion of primary disk based on the logical block address (LBA)*** in supporting the error detection and correction process [col. 8, lines 16-25; col. 11, claims 11; col. 12, claim 18] via ***a disk and array controllers*** [col. 5, lines 41 through col. 6, lines 26].

As per claims 9-16:

Due to the similarity of claims 9-16 to claims 1-8 except for and apparatus for operating a Redundant Array of Inexpensive Disks (RAID) to recover from a read errors comprising a disk controller, a RAID controller, remapping the sector, retrieving data from a mirror disk, etc… instead a method for operating a Redundant Array of Inexpensive Disks (RAID) to recover from a read errors comprising a disk controller, a RAID controller, remapping the sector, retrieving data from a mirror disk, etc…; therefore, these claims are also rejected under the same rationale applied against claims 1-8. **In addition, all of the limitations have been noted in the rejection as per claims 1-8.**

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

6. A shortened statutory period for response to this action is set to expired THREE (3) months, ZERO days from the date of this letter. Failure to respond within the period for response will cause the application to be abandoned. 35 U.S.C. 133.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dieu-Minh Le whose telephone number is (571) 272-3660. The examiner can normally be reached on Monday - Thursday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Baderman can be

reached on (571)272-3644. The Tech Center 2100 phone number is (571) 272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DIEU-MINH THAI LE
PRIMARY EXAMINER
ART UNIT 2114

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10/24/06